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The Abstract was objected to because it did not describe the features of claim 5 and the last four lines of claim 9. In response to this objection, the Abstract has been amended as requested to include these features. A clean copy of the Abstract is attached.

The Title was objected to as not descriptive. The Title has been amended to recite further aspects of what is claimed.

The Specification was objected to under 17 CFR 1.74 because the brief description of the drawings and the specification do not contain references to newly added figures 18 – 33. It appears that, when formal drawings were submitted, extra drawings including figures 18 – 33 were erroneously included. Figures 18 – 33 have been deleted to correct the error.

Drawings

The drawings were objected to under 37 CFR 1.83(a). The Office Action states that the subject matter of claim 5 and the last four lines of claim 9 must be shown or the feature(s) canceled from the claims(s). A proposed drawing correction or corrected drawings are required. The Drawings have been accordingly amended to show, in Figure 3, the “backplane” as recited in claims 5 and 9. A proposed drawing correction is attached to this Amendment. The specification has been amended to recite a reference number where the backplane is referenced. Clean copies of the amended specification pages are attached.

Claim Rejections – 35 U.S.C. § 103

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Claims 1 – 3 and 5 – 9 were rejected under 35 U.S.C. 103(a) as being unpatentable over Kedem, U.S. Patent No. 6, 195, 761 , in view of van der Wal, A. Claim 4 was rejected under 35 U.S.C. 103(a) as being unpatentable over Kedem in view of van der Wal and further in view of Sato. The Applicant has attached hereto a Statement of Common Ownership of the Kedem patent. It is therefore respectfully requested that this rejection be withdrawn.

Please note that the Applicants have also included in the Statement of Common Ownership the cited U.S. patent to Blumenau et al., U.S. patent no. 6,493,825 B1.

Claims 1-3 and 6-8 were rejected under 35 U.S.C. 103(a) as being unpatentable over the Symmetrix Model 5500 Product Manual, Rev. G, EMC Corp., pp. 1-236 (Symmetrix Product Manual), in view of Litt, U.S. Patent No. 5,815,651, and further in view of van der Wal, A., "Efficient Interprocessor Communication in a Tightly Coupled Homogeneous Multiprocessor System," Proc. Of the IEEE Workshop on Future Trends of Distributed Computing systems, IEEE, pp. 362-368, October 1990. This rejection is respectfully traversed.

The Applicants' exemplary claim 1 sets forth:

"A messaging mechanism for inter-processor communication comprising: a shared service processor providing a single point of contact for a user interfacing with at least one line processor, the service processor in electrical communication with shared memory including mailboxes operable to enable communication between the at least one line processor and the service processor; wherein the service processor is operable to selectively deliver commands to a respective mailbox of a selected one of said at least one line processor, and the service processor is selectively operable to issue a system management interrupt to any or all of the at least one line processors, the interrupt signaling to the at least one line processor to access a respective mailbox in the shared memory."

The Office Action contends that the Symmetrix Product Manual discloses a system comprising a shared service processor that communicates with the line processors via a serial interface. Actually the shared service processor communicates with the subsystems via the RS-

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232, but the Applicants agree that the service processor is in communication with the line processors.

The Office Action further sets forth that Litt teaches a system in which the "service processor is connected to various controlled processors via a parallel bus as opposed to a serial bus". The Applicants respectfully point out that, nowhere do the claims recite the manner of bus technology used to interconnect the service processor with the shared memory or line processors. That interconnection may be parallel or serial. Litt is therefore considered irrelevant to the claims.

The Office Action does correctly state that "the combination of the Symmetrix Product Manual in view of Litt does not teach a system wherein: (a) the service processor is in electrical communication with shared memory including mailboxes operable to enable communication between the at least one line processor and the service processor; (b) the service processor is operable to selectively deliver commands to a respective mailbox of a selected one of said at least one line processor; (c) the service processor is selectively operable to issue a system management interrupt to any or all of the at least one line processors, the interrupt signaling to the at least one line processor to access a respective mailbox in the shared memory."

The Office Action then contends that van der Wal teaches a multiprocessor system in which processors connected on a bus communicate using mailboxes and interrupts. The Office Action admits that van der Wal does not teach the use of mailboxes and interrupts in the particular context of line and service processors. However, the Office Action contends that it would have been obvious to combine van der Wal's communication scheme using shared memory mailboxes and interrupts with the system of the combination of the Symmetrix Product Manual in view of Litt because "a person of ordinary skill in the art would clearly recognize that

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some interprocessor communication scheme must be selected to implement the system of the combination of the Symmetrix Product Manual in view of Litt. Otherwise, the system could not operate." The Office Action adds as motivation "a person of ordinary skill in the art would recognize that reducing bus contention is an important consideration ... and would therefore choose the interprocessor communication scheme described by van der Wal.

The Applicants respectfully contend that this conclusion relies on impermissible hindsight. First of all, the assertion that "some interprocessor communication scheme must be selected ... Otherwise, the system could not operate" certainly does not explain why any of hundreds of other known schemes would not have been selected. Furthermore, many interprocessor communication schemes are designed to reduce bus contention. Van der Wal is chosen from them only in hindsight.

In addition, van der Wal teaches away from the offered motivational argument that one would recognize that reducing bus contention is an important consideration, as explained in van der Wal, Col. 2, 2nd full paragraph:

"Moreover, a global interrupt mechanism degrades performance of the system because of bus contention by multiple interrupts".

Van der Wal then goes on to explain a message based distributed interrupt scheme to reduce this contention. (Note the Applicant has claimed "the service processor is selectively operable to issue a system management interrupt to any or all of the at least one line processors...") So, the only reason one would combine van der Wal with the Symmetrix Product Manual is if one realized that by doing so, important backplane bandwidth could be consolidated. These references make no such suggestion. Therefore, any motivation to combine them comes only from hindsight in light of the Applicants' specification.

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For these reasons, the Applicants assert that the cited references, taken alone or together, simply fail to teach or suggest any motivation to provide “...the service processor is operable to selectively deliver commands to a respective mailbox of a selected one of said at least one line processor, and the service processor is selectively operable to issue a system management interrupt to any or all of the at least one line processors, the interrupt signaling to the at least one line processor to access a respective mailbox in the shared memory.”

The Applicant therefore respectfully requests that the rejection with regard to claim 1 be withdrawn. Claims 2-3, dependent on claim 1, are believed allowable for the same reasons as set forth for claim 1. Claims 6-8 are method claims corresponding to apparatus claims 1-3, respectively. The Applicant therefore respectfully requests that the rejection with regard to claims 1 – 3 and 6 – 8 be withdrawn.

Claim 4 was rejected over the combination of the Symmetrix Product Manual in view of Litt and further in view of van der Wal and further in view of Sato. Claim 4 depends from claim 1 and recites “The messaging mechanism of claim 1, wherein said shared service processor further is electrically interconnected to nonvolatile memory for storing initialization and/or boot information for the service processor and at least one line processor.” Sato is presented to as an example of the use of non-volatile memory for storing initialization and/or boot information. However, claim 4 depends from claim 1. The addition of Sato to the Symmetrix Product Manual, Litt, and van der Wal fails to solve the deficiencies of the combination as previously described. No prima facie case of obviousness has been established with regard to the application of the Symmetrix Product Manual, Litt, and van der Wal to claim 1. Thus the applicant asserts that claim 4 is allowable for the reasons set forth with regard to claims 1 – 3 and 6 – 8.

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Applicants have made a diligent effort to place the claims in condition for allowance. However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone Mary Steubing, Applicants' Attorney at 978-264-6664 so that such issues may be resolved as expeditiously as possible.

For these reasons, and in view of the above amendments, this application is now considered to be in condition for allowance and such action is earnestly solicited.

Respectfully Submitted,

Date


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Statement of Common Ownership

US patent 6,195,761 B1 ("Kedem") was filed on December 31, 1997, and issued on February 27, 2001. Kedem therefore qualifies as 102(e) prior art to the Applicant's parent Application filed on December 18, 1998. US patent 6,493,825 B1 ("Blumenau") was filed on June 29, 1998, and issued on December 10, 2002, thus also qualifying as 102(e) prior art to the Applicants' parent Application. Under the AIPA, continuing patent applications filed on parent applications filed before May 29, 2000 are subject to the AIPA rules governing 103 rejections.

In accordance with the AIPA rules, 103 rejections based on commonly owned 102(e) prior art may be disqualified. The Applicant asserts that Kedem, Blumenau, and the Applicants' pending Application were all 100% commonly owned by EMC Corporation of Hopkinton, MA at the time the invention described in the Application was made, as is evidenced by the Assignee references on the Kedem and Blumenau patents. The Applicants therefore respectfully request that Kedem and Blumenau be disqualified as prior art to Applicants' invention for purposes of 35 U.S.C. 103.